

Amendments to the Specification:

Please replace the paragraph beginning at page 1, line 3, with the following amended paragraphs:

Cross-Reference to Related Applications

This is a divisional of United States patent application Serial No. 09/487,137, filed January 19, 2000, now abandoned, which claims priority of United Kingdom application number 9901153.8 filed on January 19, 1999.

Field of the Invention

The present invention relates to manufacture of granola and snack-food products, and in particular to manufacture of hand-held snack-food products such as granola bars made up typically of nuts, dried fruit and/or cereal products in a binder.

Please add the following new heading before the paragraph beginning at page 1, line 8, which starts with "In a known method of making":

Background of the Invention

Please replace the paragraph beginning at page 1, line 20, with the following amended paragraph:

In the known method, the step of breaking or cutting the sheet of dried, adhered components into the desired sizes and shapes can result in waste of material, such as small bits of nuts or fruit that [[break-off]] break off before packaging of the snack-food products. A sieving step is required to remove these small bits from the finished product.

Please add the following new heading before the paragraph beginning at page 2, line 10, which starts with "In accordance with the invention, a method":

Summary of the Invention

Please replace the paragraph beginning at page 2, line 23, with the following amended paragraph:

Thus, the binder is in a liquid state at the elevated temperature used for mixing of the product ingredients and sets when cooled, binding the ingredients for the product and setting to a relatively non-sticky and dry state suitable for the desired end product without further drying or processing steps. It is hence an advantage of the invention that the drying steps seen in the prior art methods are largely or wholly removed from the process of the present invention. The [[ingredient]] ingredients are typically selected from the group consisting of fruit, dried fruit, cereal products, cereal flakes, and mixtures thereof, and preferably selected from the group consisting of oat flakes, wheat flakes, hazelnuts, coconut, crisp rice and mixtures thereof. The weight ratio of binder: ingredients is generally about 25-45:75-55. By elevated temperature it is intended to mean a temperature at which the binder is in a liquid state and is sufficiently liquid for snack-food product ingredients to be mixed with the binder by conventional mixing equipment. The elevated temperature is preferably at least about 60°C, more preferably at least about 80°C and even more preferably at least about 90°C. Generally, the binder and the ingredients are at substantially the same temperature during mixing, so that the binder remains liquid during mixing and does not set until the product precursor has been formed and then cooled.

Please add the following new paragraph after the paragraph beginning at page 3, line 13:

Brief Description of the Drawing

The figure illustrates a block diagram of the various processing stations that can be employed in accordance with one embodiment of the invention.

Please replace the paragraph beginning at page 3, line 22, with the following amended paragraph:

Detailed Description of the Invention

In embodiments of the invention the binder is a sugar solution which is liquid at elevated temperature and which is set when cooled to below about 40° [[degrees]] C. Room temperature is generally considerably below about 40° [[degrees]] C and thus the binder advantageously sets so that in use binder will not risk melting in the hand of the consumer or in storage or in transit.

Please replace the paragraph beginning at page 5, line 5, with the following amended paragraph:

A binder for use in the invention may be prepared by dissolving one or more sugars selected from the group consisting of maltose, saccharose, galactose, fructose and glucose in water to form an aqueous sugar solution, and heating the solution to evaporate water from the solution and concentrate the sugar or sugars therein, to form a binder which is liquid at elevated temperature and which sets when it has been cooled to room temperature. As more water is evaporated so the boiling temperature of the binder increases. Typical sugar solutions start to boil at about 100° [[degrees]] C or a little higher and can then be heated until the water content has been reduced to a point at which the boiling temperature is above about 120° [[degrees]] C, preferably above about 130° [[degrees]] C, and most preferably about 135 - 145° [[degrees]] C. A solution of roughly equal amounts of maltose and saccharose can be boiled to a water content of approximately 2% at about 140° [[degrees]] C to produce a specific, preferred binder for the invention.

Please replace the paragraph beginning at page 5, line 21, with the following amended paragraph:

The method of the invention is suitable for manufacture of snacks such as "granola" bars from ingredients such as nuts, fruit, dried fruit, cereals, and cereal products.

Particularly good results have been obtained in a method comprising, at a temperature of 90° [[degrees]] C or higher, mixing ingredients for the product with liquid binder to obtain a formable mixture, wherein the binder is a sugar solution with a solids content of about 98% by weight and is liquid at 90° [[degrees]] C and sets when cooled to room temperature; then at 90° [[degrees]] C or higher, whilst the binder is still liquid, forming the mixture into product precursor, and thereafter cooling the precursor to set the binder, thereby obtaining the snack-food product. The ingredients are preferably mixed at a temperature of 100° [[degrees]] C or higher, though not so high as to risk caramelization or burning of the binder. The product precursors are preferably formed at 100° [[degrees]] C or higher. The method of the invention is also suitable for manufacture of breakfast cereals such as those known and marketed as Cruesli, Harvest Crunch and 100% Natural (all registered trademarks in the UK and/or USA). In the case of breakfast cereals the mixture is typically formed into a product precursor that is a natural-shaped cluster of ingredients. For manufacture of products such as granola bars the product precursor is bar-shaped.

Please replace the paragraph beginning at page 8, line 14, with the following amended paragraph:

A yet further aspect of the invention provides apparatus 10 for making a granola or snack-food product, comprising:-

a mixing station 12, for mixing of a binder solution with ingredients for the product;

a forming station 14, for forming of a mixture of ingredients plus binder into product precursors, said forming taking place at elevated temperature;

first transfer means 16 for transfer of the mixture from [[the]] mixing station 12 to [[the]] forming station 14;

a cooling station 18 for cooling of product precursors formed in [[the]] forming station 14 to a temperature at which the binder sets and product is obtained; and

second transfer means 20 for transfer of the formed product precursors from [[the]] forming station 14 to [[the]] cooling station 18.

Please replace the paragraph beginning at page 9, line 15, with the following amended paragraph:

In the apparatus of the invention, [[the]] mixing station 12 is suitably for receipt, batch-wise or continuously, of liquid binder from binder preparation apparatus and for receipt of dried ingredients from ingredients preparation apparatus. Thus the process can be seamlessly integrated so that binder and ingredients are prepared separately and fed into [[the]] mixing station 12.

Please replace the paragraph beginning at page 11, line 14, with the following amended paragraph:

In a specific embodiment of the invention, snack-food product ingredients are blended with a super-saturated sugar solution at a temperature that is at least 90° C. The mixture of ingredients and binder is thoroughly mixed and formed into the size and shape of the hand-held snack-food items desired as the end product of the process. These are allowed to cool and the binder has set once the temperature has reached below 70°C. At this stage, before the products have cooled completely to room temperature, the outsides of the products are found to be substantially dry and non-sticky and hence the products can be packaged even before they have completely cooled.

Please replace paragraph beginning at page 11, line 25, with the following amended paragraph:

The invention [[hences]] hence also provides a method of manufacture of a granola or snack-food product, comprising use of a super-saturated sugar solution to bind ingredients for the product, wherein the super-saturated sugar solution and ingredients are mixed at elevated temperature, at which temperature the sugar solution is in liquid form, and wherein the resultant mixture of sugar solution plus ingredients is thereafter cooled into a product. The sugar solution is preferably selected so that after cooling no drying of the product is necessary before the product is in a state suitable for it to be packaged and/or otherwise processed. It is also preferred that the sugar solution is such that the process of cooling the mixture of sugar solution plus ingredients into a cooled product is essentially [[essential]] reversible, so that cooled product can be re-heated and re-formed either into new product or different product without wastage or detriment to the eventual product.

Please replace the paragraph beginning at page 14, line 20, with the following amended paragraph:

On exiting the enrober, the rounded pellets are transferred to a sieving station, where pellets larger than 16mm diameter or smaller than 10mm diameter are sieved off and removed. Pellets larger than 16mm diameter are passed [[past]] to a breaking station after which they are refed into the sieving station. Particles less than 10mm diameter are passed to the grinding station where they are ground into fine material and added to the enrober. Surplus material less than 10mm diameter, if there is any surplus, is passed as [[rework]] re-work material to the initial mixing station, thus avoiding wastage.

Please replace the paragraph beginning at page 14, line 29, with the following amended paragraph:

Whilst the cutting diameters and sieving diameters have been specified [[specied]] above, these diameters are adjustable according to the needs of the product.